

**CLAIMS**

The following is a detailed listing of all claims that are, or were, in the Application.

1. (Cancel)

2. (Currently Amended) The system of claim 1 A digital control system for voltage converters, comprising:  
an oscillator that issues a pulse;  
a duty cycle generator, wherein the pulse is used to load a numerical value stored in a memory of the system into the duty cycle generator;  
a digital counter that stores and alters a duty cycle;  
a first comparator that determines how the duty cycle must be modified; and  
an algorithm generator producing an algorithm that determines the rate of change of the duty cycle;

wherein if the comparator detects that an output voltage is higher than a reference voltage, the comparator retards the issuance of the pulse in a cyclical fashion, thereby creating a burst of pulses with a desired duty cycle.

3. (Original) The system of claim 2 further comprising a second comparator having a reference different than the first comparator.

4. (Cancel)

5. (Currently Amended) The method of claim 4 A method for producing a desired output voltage comprising:  
storing in memory, an indication of a pulse duty cycle needed for a varying load;  
monitoring the load;

altering the stored duty cycle at a first frequency to produce the desired output voltage based upon the indication; and

if a change in the load is detected, changing the frequency of alteration of the duty cycle;

wherein the indication comprises a digital counter, and wherein changing the frequency of alteration of the duty cycle comprises changing the frequency of updating the digital counter.

6. (Currently Amended) The method of claim 4 5 wherein monitoring the load comprises usage of two or more comparators.

7. (Currently Amended) The method of claim 4, A method for producing a desired output voltage comprising:

storing in memory, an indication of a pulse duty cycle needed for a varying load;  
monitoring the load;

altering the stored duty cycle at a first frequency to produce the desired output voltage based upon the indication; and

if a change in the load is detected, changing the frequency of alteration of the duty cycle;

wherein if the load increases, the frequency of alteration is increased, thereby minimizing a dip in the output voltage.

8. (Original) The method of claim 6, wherein the two or more comparators each have a different reference.

9. (Original) A voltage converter that produces an output voltage, comprising:  
a digital controller that controls the output voltage of analog circuitry;

a numerical value stored in a memory of the converter;  
a duty cycle generator that utilizes the numerical value to alter the duty cycle of the analog circuitry;  
a first comparator that compares the output voltage to a reference voltage at a first rate; and  
a second comparator that compares the output voltage to the reference voltage at a second rate,  
wherein the numerical value is updated based upon a comparison at the first or second rate.

10. (Original) The voltage converter of claim 9 further comprising an algorithm generator that selects the speed that the numerical value is updated.

11. (Original) The voltage converter of claim 9 wherein the digital controller selects either the first or second rate.

12. (Original) The voltage converter of claim 9 wherein when either comparator detects that the output voltage is higher than the reference voltage it decreases the duty cycle.

13. (Original) The voltage converter of claim 9 wherein when either comparator detects that the output voltage is lower than the reference voltage it increases the duty cycle.

14. (Original) The voltage converter of claim 9 wherein the numerical value is stored in an up-down counter in the memory, and wherein if either comparator detects that the output is lower than the reference voltage it switches the up-down counter in up mode, and if the reference voltage is lower, it switches the up-down counter in down mode.

15. (Original) A method for bucking or boosting a voltage, comprising:  
providing groups of pulses, each group comprising one or more pulses;  
detecting the rate of change of an output voltage over time;  
modifying the frequency of generation of the groups of pulses in response to said rate of change;  
detecting the magnitude of the output voltage; and  
changing a pulse width of the output voltage in response to the detected magnitude.
16. (Original) A digital controller of a voltage regulator, comprising:  
an up/down counter that stores a numerical value used to alter a duty cycle of the controller driving a transistor/switch;  
a duty cycle generator that utilizes the numerical value to alter the duty cycle; and  
an algorithm generator that produces an algorithm that alters the rate of change of the duty cycle.
17. (New) The method of claim 7 wherein monitoring the load comprises usage of two or more comparators.
18. (New) The method of claim 17, wherein the two or more comparators each have a different reference.